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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,202	01/22/2004	Guping Tang	4249-0115P	2330

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EXAMINER	
POPA, ILEANA	
ART UNIT	PAPER NUMBER
1633	

NOTIFICATION DATE	DELIVERY MODE
04/15/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/761,202	TANG ET AL.	
	Examiner	Art Unit	
	ILEANA POPA	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-19 and 21-35* is/are pending in the application.

4a) Of the above claim(s) *30-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-19 and 21-29* is/are rejected.

7)☒ Claim(s) *1 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/29/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/05/2007 has been entered.

Claims 3, 4, 20, and 36-39 have been cancelled. Claims 30-35 have been withdrawn.

Claims 1, 2, 5-19, and 21-29 are under examination.

Note: Change in Art Unit and SPE

The Examiner of record is now Ileana Popa, Art Unit 1633. Therefore, future correspondence should reflect such changes. Also, at the end of the Action is the information regarding the SPE and the Art Unit.

2. The following rejections are withdrawn in response to Applicant's arguments filed on 10/05/2007:

The rejection of claims 1, 2 and 5-19 under 35 U.S.C. 112, first paragraph for introducing new matter.

Upon further considerations and in view of claim amendments, the following rejections are withdrawn in favor of new rejections as set forth below:

The rejection of claims 1-2, 5-9, 11-12, 16-18, 21-25 and 29 under 35 U.S.C. 103(a) as being unpatentable over Kosak et al (US Patent Publication No: US 2001/0034333) and Davis et al (US Patent No: 6,509,323);

The rejection of claims 10, 13-15, and 26-28 under 35 U.S.C. 103(a) as being unpatentable over Kosak et al (US Patent Publication No: US 2001/0034333) and Davis et al (US Patent No: 6,509,323), further in view of Cheng et al (US Patent Publication NO: US2004/0077595).

Claim Objections

3. Claims 1 and 16 are objected to because of the following informalities: claims 1 and 16 use the alternate spelling of "polyethyleneimine" in the last line. To maintain consistency throughout the claim, correction to "polyethylenimine" is suggested.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 5-19, and 21-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al. (WO 00/33885), in view of each Gosselin et al. (Bioconjugate Chem, 2001, 12: 989-994, Applicant's IDS), Cheng et al. (U.S. Patent No. 7,270,808), and Wachter et al. (Nucleic Acids Research, 1986, 14: 7985-7994).

Davis et al. teach a biodegradable, linear cyclodextrin block copolymer and a method of synthesizing the block copolymer by modifying β-cyclodextrin at only two positions and reacting the modified cyclodextrin with a linear polycationic co-monomer such as spermine (i.e., a transfection agent) to form a block copolymer wherein cyclodextrin is attached to spermine and not to another cyclodextrin moiety; since it contains spermine, the polymer has a net positive charge and is therefore capable of complexing with nucleic acids; (claims 1, 2, 8, 16, 17, and 29) (p. 8, lines 9-30, p. 9, lines 1-12 and 24-29, p. 12, lines 12-30, p. 13, lines 5-11, p. 16, line 2, p. 31, line 1). Davis et al. teach their copolymer as being suitable for nucleic acid delivery to a cell (claim 1) (p. 29, lines 12-16).

Davis et al. do not teach a cyclodextrin block copolymer wherein the co-monomer is low molecular weight PEI (claims 1, 5-6, 16, 21-23, and 29). Gosselin et al. disclose that high molecular weight PEI is toxic to the cells and teach replacing it with high molecular weight biodegradable conjugates composed of cross-linked 800Da PEI, wherein the high molecular weight biodegradable conjugates are less toxic and able to efficiently deliver nucleic acids to cells (Abstract, p. 989, column 2, p. 990, column 2 and Fig. 1, p. 992, column 2). It would have been obvious to one of skill in the art, at the time the invention was made, to modify the copolymer of Davis et al. by replacing their

transfection agent (i.e., spermine) with the transfection agent of Gosselin et al. (i.e., 800Da PEI), with a reasonable expectation of success. The motivation to do so is provided by Gosselin et al., who teach PEI as a very efficient transfection agent which also offers advantages over the other transfection agents in that it protects nucleic acids from degradation by lysosomal nucleases and facilitates their escape from endosomes (p. 989, column 1). It is noted that, by doing such, one of skill in the art would have obtained a high molecular weight biodegradable conjugate (or copolymer) wherein 800 Da PEI is cross-linked by cyclodextrin (claims 1, 5-6, 16, 21-23, and 29). One of skill in the art would have been expected to have a reasonable expectation of success in doing so because the art teaches that PEI can be successfully copolymerized with cyclodextrin (see Cheng et al., column. 21, lines 10-27, column 23, lines 14-51)

Davis et al. and Gosselin et al. do not teach cross-linking cyclodextrin and PEI via an ester bond (claims 11, 12, 24, and 25). However, at the time of filing the use of ester bonds to couple cyclodextrin to PEI was known in the prior art (see Cheng et al., column 10, lines 26-30, column 24, lines 3-5). It would have been obvious to one of skill in the art, at the time the invention was made, to modify the method of Davis et al. and Gosselin et al. by using the teachings of Cheng et al. to link cyclodextrin and PEI via a biodegradable ester bond, with a reasonable expectation of success. The motivation to do so is provided by Gosselin et al., who teach that introduction of biodegradable bonds promotes reversion to low molecular weight PEI for less toxicity and easier access by the transcription machinery (p. 989, column 2). One of skill in the art would have been

expected to have a reasonable expectation of success in doing so because Cheng et al. teach that such bonds can be successfully used to link cyclodextrin and PEI.

With respect to the limitation of using Davis et al. and Gosselin et al. as an activating agent (claims 9, 10, 18, and 19), it is noted that the art teaches that that 1.1'-carbonyldiimidazzole can be successfully used to link hydroxyl and amine groups (i.e., groups found on cyclodextrin and PEI, respectively) (see Cheng et al., column 61, lines 49-55; Wachter et al., Abstract, p. 7895, p. 7989, Fig. 1). Therefore, it would have been obvious to one of skill in the art, at the time the invention was made, to use 1.1'-carbonyldiimidazzole to achieve the predictable result of coupling cyclodextrin to PEI.

With respect to the limitations recited in claims 13-15 and 26-28, absent evidence of unexpected results, it would have been obvious to one of skill in the art to vary the parameters (i.e., the number of PEI units within the copolymer) with the purpose of optimizing the results (i.e., nucleic uptake by cells). Again, absent evidence to the contrary, it is generally not inventive to discover the optimal working conditions of a prior art method, such conditions can be identified by routine experimentation MPEP: 2144.05 [R-3].

Thus, the claimed invention was *prima facie* obvious at the time the invention was made.

6. No claim is allowed. No claim is free of prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ILEANA POPA whose telephone number is (571)272-5546. The examiner can normally be reached on 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached on 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ileana Popa, PhD
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Art Unit 1633